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Introduction

Nearly all American children watch countless hours of television, even in their earliest years. The activity of television viewing may appear at first thought to be simple and straightforward—the child sits in front of the television set, watches, listens, and understands. In fact, however, the process behind this watching and listening turns out to be quite complex and, as yet, little understood. Just as learning to read or speak requires the development of a multitude of symbol-using capacities, so, too, does acquiring the ability to interpret, understand, and draw inferences from television programming (Wolf 1979; Worth 1974; Worth and Gross 1974).

Far from awakening one day with a full vocabulary of words with which to communicate, children progress gradually through a series of developmental stages in their acquisition of language. Similarly, they must gradually acquire methods of mastering the communications of the television world. To achieve this mastery, children must accomplish two principal tasks. They must establish television's symbolic status, that is, its relation to their world of daily experience; and they must sort its various elements—such as types of programming—classifying them and organizing them into a coherent medium of communication.

Consider some of the problems faced by the young child bent on decoding television. To begin with, its ever-changing images and sounds are beyond the child's control. He cannot manipulate or reexamine particularly interesting characters, objects, or events, for they are contained within a box and separated from him by a piece of glass. Yet the objects, characters, and events often appear so similar to those which actually exist around the child that the two forms may at first seem indistinguishable. For this reason, it is possible that the child may have difficulty acknowledging the symbolic status of television (Worth and Gross 1974). The child may confuse events on television with natural events, attempt to act directly upon them, and thus imbue them instead with "existential meaning."

In order to master the world of television, he must explore the images and sounds which emerge from it and eventually recognize their various relationships to his own experience, to worlds or symbol systems with which he is already familiar. As Nelson Goodman aptly states, "Worldmaking as we know it always starts from worlds already on hand; the making is re-making" (Goodman 1978). The child must establish the fact that television is, in fact, a world of its own, one which contains elements that relate directly to the "real" world, others that are completely fantastic and exist only in the world of television, and still others that combine both real and fantastic elements. He must determine the nature of the boundary or, as we have come to term it, the membrane between the two worlds, the extent of its permeability, impermeability, or semipermeability.

In addition to establishing the fact that (and the manner in which) television transmits its various symbol systems, a newcomer must also learn to decode the inner workings of this medium, its organization and its format. To a sophisticated viewer, the world of television is a neatly packaged, clearly organized, simple and convenient form of entertainment. This viewer is able to choose exactly which shows he wishes to watch, to turn the set on for these shows alone, and to be attentive to the degree that he desires. This control and the choices made by a sophisticated viewer are dependent, however, upon the construction of a complex classification system or, in Sol Worth's words, a series of "conventions for ordering the universe" (1974) of television.

The television world is comprised of many types of fare, each of which has identifying features that must be learned and that differentiate one type of fare from another. For example, commercials interrupt other types of fare (such as cartoons or situation comedies), featuring music, familiar jingles, sudden increases in volume, and/or lettering across the screen. Narrative cartoons are distinguished from most other types of shows in that they are animated and often very fast-paced. News shows have characteristic "factual" information: they often begin with a logo and an anchorperson seated behind a desk and feature shots for weather, sports, and commentary. Some shows are intended for children, some for adults. Some shows are comedies designed to make people laugh, while others are thrillers meant to frighten people. Still others are educational, providing accurate information about the "real" world or about other symbol systems (e.g., music or art).

Given our knowledge of symbolic capacities in young children, it is at best implausible to assume that a child with no exposure to the medium possesses the innate cognitive structures necessary for assimilating its diverse images and sounds. Rather, it is more likely that a child will progress through a series of developmental phases in determining the proper relationship between television and the real world and in classifying appropriately the communications of television, including show types with their individual visual and audio features (Bruner, Olver, and Greenfield 1966; Gardner and Wolf 1979; Piaget 1952, 1954; Vygotsky 1962; Wolf and Gardner, forthcoming).

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Conceptual Framework and Hypotheses

In a longitudinal study of early television competence, we examined the development of preschoolers' television viewing skills and the processes of change which underlie their growing sophistication in understanding the symbol system it embodies. In particular, children's comments regarding the relationship between television and real life and their associations between the two realms were analyzed. Furthermore, we examined the development of preschool children's understanding of the relationship between various types of television fare and their ability to establish categories to distinguish these types, to group shows according to common characteristics or features, to recognize their beginnings and endings, and to learn the time schedules of various shows.

Following examples of earlier work cited above, we followed three subjects intensively over a 3-year period, from the time they were 2 years old to the time they were 5. In addition, nine other subjects were monitored in a less regular and less formal way. Though this additional group broadens our sample, three well-studied cases do not of course constitute an adequate sample, and therefore any generalizations must be considered tentative.

In this effort, we have found it particularly helpful to invoke the image of "membranes." As we see it, the child must take the relatively undifferentiated experiences of televised and daily life and, over the course of several years, construct a set of membranes: membranes which define the relationship between what is shown on television and what occurs in the realm of daily mundane experience; and membranes which define the relationship between the various types of programs and program features which populate the several channels of television.

We favor the term "membrane" over the more conventional usage of "category" and "boundary" for two reasons. First, many of the distinctions which obtain in the area of television viewing are much less rigidly defined than conventional and long-standing categories, and indeed change quite rapidly across television seasons. Second, the way in which children's own conceptions of television fare shift are reminiscent of different types of organic membranes: sometimes impermeable, sometimes completely permeable, and, eventually, semipermeable in nature.

Expectations

Clearly, the development of children's abilities to perceive the membranes which organize the inner world transmitted on television and which separate this world from the real world relates to the development of their more general abilities to classify and form categories. Children's emerging abilities to classify objects, people, and words have been studied in depth (Denney 1974; Kagan, Moss, and Sigel 1963; Rosch et al. 1976; Rossi and Rossi 1965; and references cited above).

In accordance with the earlier literature, we expected only an incipient ability to categorize at age 2. Children can categorize to some extent at the level of the basic object; that is, they will term a passing object "cat" rather than using the superordinate term "animal" or the subordinate terms "Siamese" or "tabby cat"; and they show a tendency to ferret out prototypical exemplars from a category. However, categorization at other than basic object level proves beyond their reach. There is a strong predilection for thematic or functional classifications rather than abstract or hierarchical ones, and there is considerable tendency to either overgeneralize or undergeneralize the extension of categorical labels. Little capacity is shown for multiple or dual classification. During the preschool years, increasingly fine precision attends the application of labels, but other immature tendencies endure well into the school years.

We expected that the classification of the television world in terms of adult perceived categories would present difficulties for preschoolers: our subjects would therefore vacillate between overly broad and overly rigid categorical distinctions. For example, cartoons might be defined initially by a young child as any show involving one of the child's preferred characters, regardless of whether that character was animated or not; alternatively, cartoons might be defined as only those shows on which characters chase each other. These definitions are equally erroneous in that both exclude the crucial element of the visual appearance of cartoons—their animation.

Certain categories were expected to be beyond the grasp of our 5-year-olds, owing to the abstract concepts entailed in their definition, such as producer intent or designated target audience. For example, adult shows are not only those shows watched by the child's parents, as a young child might believe, but any show designed for viewing by an adult audience.

Our expectations could not be—and were not—drawn solely from developmental research on classification, however. Television is a medium which differs significantly from the world of physical objects of language. It presents an unusual if not unique set of stimuli—a conglomeration of several different symbol systems including language, music, and movement and a variety of visual forms such as animation, drawing, puppetry, and live-action, not to mention numerous special effects. As a result, children's processing capacities may be tested to a greater extent by television than by traditional media, and

they also may be tested in different ways—for example, in terms of the reality status of different segments.

Adding to the difficult task of decoding the television world is the fact that television is a novel medium. It is so new, in fact, that our culture has not yet invented ways of presenting it or teaching its structure to children. Therefore, much more so than in the case of traditional media (such as books), the child is left to his own devices in making sense of television. Both the difficulty and the novelty of television lead to the hypothesis that it may offer particularly daunting challenges to the young child's classificatory powers.

Fortunately, a small body of research has begun to accumulate on children's processing of, and understanding of, television during the opening years of life. The attention of young children has been related both to formal features of programs (Watkins et al. 1980) and to certain cues which signal the imminent appearance of semantically digestible materials (Collins et al. 1979; Newcomb and Collins 1979). It is this body of research, in combination with the more general developmental findings cited above, that indicates the hypotheses which have guided our research.

We hypothesized that, initially, children will make no distinctions between what they see on television and events in their daily world. Similarly, they will fail to appreciate distinctions among kinds of television programs and the boundaries or beginnings and endings which separate those programs from one another. We expected that, rather than making distinctions, children will primarily make connections between television and real life and between various types of programming. Membranes organizing the television world and separating it from real life will be perceived as permeable, if perceived at all.

The appreciation of differences between television and real life and between types of shows was expected to emerge later, with the most obvious and straightforward differences to be noted first. For example, children might distinguish cartoons before *Sesame Street* because their visual appearance or animation is so strikingly and consistently different from that of other shows. The *Sesame Street* format and appearance, on the other hand, changes often both within one show and from show to show. In addition to this "simplicity" hypothesis, we expected the age at which children distinguish one type of show from another to be determined by their *preference* for and *exposure* to a certain type of show. In establishing categories of program types and in noting differences between the world presented on television and their daily experiences, children should adhere closely to their newly formed conception of membranes and to apply this conception very rigidly. Characters will be considered show-specific and unable to cross show boundaries to appear on other shows. Children will also perceive characters as unreal and unrelated to real people. Membranes both between television and real life and within the world of television will be perceived as impermeable or firm, and similarities will be overlooked.

Finally, with increased exposure to and experience with television, children should demonstrate the more complex capacity to note both similarities *and* differences, to establish more flexible categories of program types, to accept the fact that certain programs might fall into more than one category, that characters might be able to appear on more than one show, and that certain television characters comprise a combination of real and fantastic elements. The membranes of television will be perceived ultimately as flexible in their permeability—at times permeable, at other impermeable, and at still others, semipermeable.

This ultimate conception is quite complex and very possibly beyond the grasp of the preoperational child. It involves considering more than one element at a time, thus overcoming the concentration on one element which dominates this age or stage of development. It is possible, however, that the repetitive nature of television, in conjunction with the great amount of exposure to the medium which young children receive, will facilitate the development of their understanding of its symbolic status and its organization as well as their ability to decode the symbol systems it conveys.

The Study

Population

Subjects were three first-born children from middle- and lower-middle-class families living in a suburb of Boston. They belonged to high-viewing households where little or no regulation of television took place and where the television was often on for most of the day. Subjects were 2 years old when the study began and 5 years old when data collection was completed.

Methods

The majority of the data were collected at biweekly home visits to the subjects. These visits were conducted by the same experimenter for two years and by a different experimenter (trained by the first) during the third year of data collection. The experimenter brought a variety of play materials to home visits in order to ascertain the child's competence in various skills relevant to the television medium. Among the areas examined were the abilities to discriminate among program types, to relate television content to real life experience, to recognize and recall character names and attributes, and to sequence story material (Jaglom, Wilder, and Fagre 1979; Robinson, Jaglom, and Wilder 1980; Vibbert, Jaglom, and Wilder 1980).

Tasks were designed to probe children's abilities in these various areas. For example, photographs of television fare were presented to the children and they were asked to place together the ones that "belong together," or, sometimes more specifically, to put "all the cartoons/commercials/news/kids' shows/etc. together." In this way, it is possible to uncover children's notions about a particular category and their ability to discriminate between various program types. Another frequently administered task consisted of a guessing game in which the child and experimenter alternated hiding television characters behind their backs, providing each other with clues regarding the character's attributes and guessing which character was hidden. In addition, information on the ways a televised segment was processed was obtained by asking children to order and narrate individual photographs from a single television bit or story. Symbolic or "pretense" play proved to be another revealing vehicle. The experimenter provided the necessary props for re-creating a scene viewed on television but little information as to how the story actually progressed. The child's reenactment was then studied for its verisimilitude to the televised segment and for the information it provided about the child's concept of specific characters, their prototypical behaviors and attributes, and of the format or sequence of television content in general (e.g., how television bits or shows begin and end, the fact that stories are often interrupted by commercials). During all biweekly visits, children's television program preferences were noted, and one-half hour of the child's natural television viewing was observed.

A supplementary method of data collection consisted of the viewing of videotapes of various types of television fare on a quarterly basis. Children were brought into the Media Center at the Harvard Graduate School of Education and were shown the tapes in a comfortable and natural setting. Presentation of these tapes to the population of subjects provided a systematic way of determining how children's understanding and experience of, and reaction to, the same types of television fare changed over the course of development. All sessions, both home visits and videotape sessions, were recorded on an audio cassette tape recorder. Children's viewing of videotapes was additionally recorded on videotape in order to preserve facial and physical reactions to various types of fare. Typed verbatim transcripts were kept of all sessions.

A final method of data collection relied on the parents' cooperative efforts as coresearchers. Parents participated in biweekly interviews with the experimenter and kept diaries of their children's television-related comments and experiences.

Television–Real Life Associations: Establishing Television's Symbolic Status

Analysis

All instances in which children related television content to real life experience, as well as all instances in which real life experience was related to television content, were extracted from transcripts of home visits and videotape sessions and also from parent diaries. The majority of associations were made spontaneously, though some were prompted by the parents' or experimenter's questions.

The children's associations were classified in terms of their directionality. An association made while viewing, from the television to the real world, was labeled a Television–Real Life (hereafter TV-RL) Association. An association made in the context of daily experience and related to content previously viewed on television was labeled a Real Life–Television (hereafter RL-TV) Association. TV-RL associations were recorded by both parents and the experimenter, while RL-TV associations, owing to their unpredictable nature, were recorded primarily by parents. The data were scrutinized and associations grouped into descriptive categories or types characterizing their various qualities. Associations were then examined at 6-month intervals for the frequency of the various categories described below. Some of these types of associations lend themselves to nonverbal association (e.g., noticing Similarities or Imitation), while others are necessarily verbal (e.g., Statements of Representation or Differences).

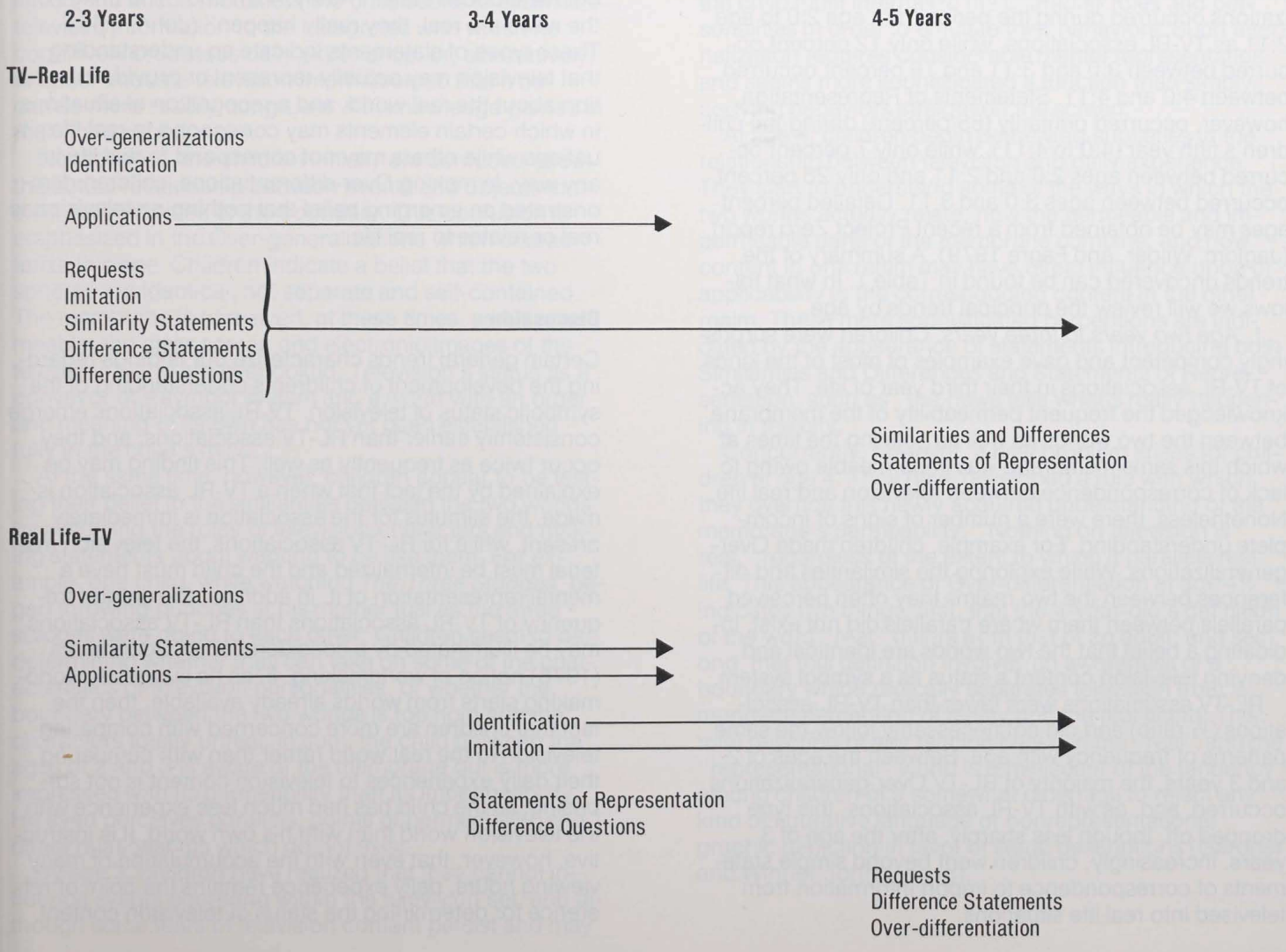
Types of Associations. Two major types of associations were established: Investigating Similarities and Investigating Differences. Within these major categories were several subcategories. For example, in Investigating Similarities children made Over-generalizations which indicate a belief that televised events are identical to and have immediate and direct influence upon the child's own life and, concurrently, that the child can directly influence televised events. One such Over-generalization was a child's fear that a frightening television character was in his room. They also made Statements of Similarity, linking an object, event, or character in one world to a similar one in the other, but not necessarily indicating a belief that the two are identical. For example, one child saw a rubber duck in real life and associated it with one on *Sesame Street* saying, "Rubber ducky, just like Ernie's."

Children also applied information gained in one realm to similar situations in the other (Application); imitated or reproduced television situations (Imitation); identified with television characters by linking themselves with those characters (Identification); made requests for televised objects, indicating an understanding that those objects exist and are available in the real world (Requests); and finally, made Statements of Representation, recognizing the fact that television programming sometimes

actually represents or provides information about real world events. In Investigating Differences between the two realms, children were found to make Statements of Differences, such as "That's a monster, that's just make-believe," recognizing that some characters or situations exist only on television and are not reproducible in the real world. They also asked questions about differences such as "Why is it night on TV and day here?" to help them determine the relationship between television and daily experience or to clarify an uncertainty about this relationship. They combined Similarities and Differences, recognizing similarities between situations or people in the two worlds but simultaneously recognizing discrepancies between those situations or people: making statements such as "I have a cat like the one on TV, but my cat doesn't talk." Finally, children over-differentiated between television and real life, overlooking all similarities and insisting that nothing on television is real or relates to the real world.

These categories of associations capture the fact that children are actively concerned with the nature of the membrane between the televised and real worlds. Children investigate similarities between the two (stressing the membrane as permeable), the differences between the two (stressing the membrane as impermeable), and the occasions on which there exist both similarities and

Table 1
Age of Onset of Association Trends



differences (a membrane which we label semipermeable). Additionally, there are times when children magnify the reality status of television content in order to make it seem more like their own experience and perhaps easier to assimilate. They even attempt to act upon events occurring within a television set, overlooking the fact that there is an actual glass boundary separating the two worlds. At other times they perceive this boundary as so complete that they ignore all similarities, deny them even when they are readily apparent, and dismiss any possibility of transfer between the two realms.

Results

Each association category was examined in terms of the age at which it occurred most frequently both as a TV-RL association and as an RL-TV association. The frequency of occurrence of a particular type of association was computed yearly as a percentage of the total number of that type of association made across all three years. For example, 72 percent of all Over-generalizations occurred during the period from age 2:0 to age 2:11 as TV-RL associations, while only 12 percent occurred between 3:0 and 3:11 and 16 percent occurred between 4:0 and 4:11. Statements of Representation, however, occurred primarily (65 percent) during the children's fifth year (4:0 to 4:11), while only 7 percent occurred between ages 2:0 and 2:11 and only 28 percent occurred between ages 3:0 and 3:11. Detailed percentages may be obtained from a recent Project Zero report (Jaglom, Wilder, and Fagre 1979). A summary of the trends uncovered can be found in Table 1. In what follows we will review the principal trends by age.

1. *Age two years to three years.* Children were surprisingly competent and gave examples of most of the kinds of TV-RL associations in their third year of life. They acknowledged the frequent permeability of the membrane between the two worlds as well as noticing the times at which this same membrane was impermeable owing to lack of correspondence between television and real life. Nonetheless, there were a number of signs of incomplete understanding. For example, children made Over-generalizations. While exploring the similarities and differences between the two realms they often perceived parallels between them where parallels did not exist, indicating a belief that the two worlds are identical and denying television content's status as a symbol system.

RL-TV associations were fewer than TV-RL associations (½ ratio) and did not necessarily follow the same patterns of frequency with age. Between the ages of 2 and 3 years, the majority of RL-TV Over-generalizations occurred, and, as with TV-RL associations, this type dropped off, though less sharply, after the age of 3 years. Increasingly, children went beyond simple statements of correspondence to import information from televised into real life situations.

2. *Age three to four years.* Children continued to make the types of associations which emerged at age 2 during the period from age 3:0 to 3:11. No new types appeared at this age, and Over-generalizations declined greatly in frequency. At this age children did begin to imitate and identify with television characters as RL-TV associations or when the television set was off and not serving as a direct stimulus. They performed whole scenes of television shows such as *Gilligan's Island, Batman,* and *The Six-Million Dollar Man,* indicating a fascination with these characters and a need to test out their roles and abilities in real life.

3. *Age four to five years.* The majority of children's Statements of Representation, all statements regarding both Similarities *and* Differences, and all Over-differentiations occurred between the ages of 4:0 and 4:11. In addition, children's first RL-TV Requests occurred at this age. Thus, 4-year-olds asked for objects they had seen advertised on television but which were not present at the time they made the request. They were also able to make statements such as "I have one of those [a cat] but mine doesn't talk" (Kathy, 4:5), and "The things on the news are real, they really happen" (John, 4:11). These types of statements indicate an understanding that television may actually represent or provide information about the real world, and a recognition of situations in which certain elements may correspond to real life situations while others may not correspond to real life in any way. In making Over-differentiations, children demonstrated an emerging belief that nothing on television is real or relates to real life.

Discussion

Certain general trends characterize our findings regarding the development of children's understanding of the symbolic status of television. TV-RL associations emerge consistently earlier than RL-TV associations, and they occur twice as frequently as well. This finding may be explained by the fact that when a TV-RL association is made, the stimulus for the association is immediately present, while for RL-TV associations, the television material must be internalized and the child must have a mental representation of it. In addition, the greater frequency of TV-RL associations than RL-TV associations may be illuminated by a consideration of Goodman's (1978) notion of worldmaking. If, as he suggests, worldmaking starts from worlds already available, then the fact that children are more concerned with comparing television to the real world rather than with comparing their daily experiences to television content is not surprising, as the child has had much less experience with the television world than with his own world. It is instructive, however, that even with the accumulation of many viewing hours, daily experience remains the point of reference for determining the status of television content.

Borrowing from linguistic theory, we can say that television continues to be the "marked" world while real life is "unmarked" (Clark 1973). At least in our population, television never acquires so dominant a position that daily experience begins to be compared to television content for determination of its reality status.

From the very first, children are aware that correspondence exists between the two worlds, that the membrane between them is permeable at times, and that in exploring the world of television, certain aspects of the real world may be useful. Concurrently, children this young are aware of instances marked by a lack of correspondence between the two worlds and realize that television content may exist in a different form in the real world or may not exist at all. Thus, they are aware that the membrane may also be impermeable at times and real experience may not be useful in understanding television at these times. We see an active and continuing effort to sort out the various contents of television and to relate them to information known in the "real" world. In Piaget's terms (1954), there are perpetual efforts at assimilation and accommodation: the child seeks to assimilate televised information to the categories with which he cognitively processes daily experience, or, alternatively, to accommodate television information so that it becomes more readily congruent with knowledge gained in real world experiences.

Nonetheless, the children initially are confused about the actual relationship between events and objects that exist on both sides of the boundary. This confusion is emphasized in the Over-generalizations which characterize this age. Children indicate a belief that the two spheres are identical, not separate and self-contained. The membrane is perceived, at these times, as fully permeable; the glass screen and electronic images of the television world are overlooked. Television's status as a conveyor of a symbol system and a world with an order and meaning of its own has not yet been established fully in the child's mind.

At the same time, however, children appear to be testing their belief in the similarities between the two worlds by assuming the roles of television characters and making statements about wanting to be like them. For example, one child, while watching *The Three Stooges,* began throwing punches at his mother just as the three stooges were doing to each other. Children seem to be determining whether they can take on some of the characteristics of television personalities, or whether the boundary between the two worlds is too rigid and the characters totally unreal. In sum, the child between the ages of 2 and 3 is aware of the membrane but is more impressed with its permeability than its impermeability. He even perceives parallels, points of permeability, and direct relationships which do not exist.

By age 3, children have realized that they cannot influence events occurring within the television set, and although some fears of television content persist and may even magnify, children have, for the most part, realized that events or characters visible on television cannot immediately affect them. Over-generalizations fade; the boundary between the two worlds has at least provisionally been formed; the lack of immediate, direct, total correspondence between the two worlds has been recognized; "communicational meaning" has been attributed to television content.

At this age children also begin to make statements indicating identification with television personalities and to imitate television characters *outside* the television context. For example, they act out whole scenes from their favorite shows without having seen the show that day. They discover that some similarities exist between television and their own lives or personalities, that some characteristics may exist or be reproduced in the real world, but that others are fantastic and do not exist across the membrane. A lack of direct stimulus may explain why these types of statements and role-modeling cluster a year later for RL-TV associations than for TV-RL associations. Without television as a direct stimulus, the child must internalize the character roles and personalities in order to emulate their behaviors. Such internalization requires considerable mental representation and seems more sophisticated a function than simply copying behaviors straight off the screen.

At age 4, children begin perceiving subtleties in the relationship between television and daily experience. They start to understand some of the ways in which the two worlds actually relate, how the permeable and impermeable parts of the membrane combine, and how content in one realm may have direct influence upon or applicability to the corresponding content in the other realm. These more sophisticated perceptions are indicated by the appearance of statements introducing both Similarities and Differences and Statements of Representation, such as "the news tells what's really happening in the city."

Concurrently, however, a new problem arises for children at age 4. They have developed a rule with which they override this newly acquired understanding of the membrane's permeability: "Nothing on television is real," regardless of the extent to which it parallels real life. This appearance of Over-differentiation at age 4½ indicates two things: first, that the 4-year-old's definition of the word "real" differs from that of an adult; and second, that this definition involves an awareness of a boundary which radically separates television from a mundane perception of reality and the real world. This total rejection of any relation between the "real" and the "representational" world is reminiscent of the tendency among children of a somewhat older age to reject any kind of figurative language or nonrepresentational graphic depiction in favor of literal descriptions (Gardner and Winner, forthcoming).

Development of a Classification System: Establishing Membranes within the Television World

Analysis

All instances in which children attempted to classify or distinguish between types of television content were extracted from the transcripts. This information included spontaneous remarks made by the subjects while watching television or playing with television-related toys as well as their responses to probes made by the experimenter. These structured probes by the experimenter were of two types. The first involved a task situation in which children were asked to sort piles of photographs of television fare into specific groups, or to re-create various types of television action with props inside a wooden television frame. In the second structured situation, the experimenter asked questions regarding the specific shows being watched during the particular session.

All statements, bits of information, or items pertaining to categories used by adults to classify the elements of the television world were first grouped according to the specific categories to which they pertained. These categories were cartoons, advertisements, news, shows designed for viewing by adults, those designed for viewing by children, and a subcategory of children's shows, *Sesame Street.* This last subcategory was included because many of the children's first attempts at classification were found to revolve around the identification of *Sesame Street* segments.

Data were examined in 6-month intervals. In the first step of analysis, we examined the ages at which each of the three children mastered the specific adult-perceived program categories as well as the average age of mastery across all three children. Next, we turned our attention to the process by which these categories are created: we investigated children's recognition of show beginnings, endings, and interruptions, their knowledge of show scheduling, their understanding of character-show connections, and their use of various cues (e.g., theme songs, station logos) in classifying the television world. These abilities were believed to be important markers in the task of sorting out the seemingly ceaseless and disorderly progression of images across the television screen.

Children's abilities to separate shows into categories were traced by use of strict definitions of program types. These types were defined by their content and explicit purpose independent of their visual appearance and formats.[1] For example, an animated advertisement may look like a cartoon, but its content indicates that it is an advertisement as well. Conversely, cartoons and other children's programs often share the same intent but differ in form.

The fact that two program types may be classified in two words is an understandable source of confusion to children, as Piaget's work on the intersection of classes has documented (Inhelder and Piaget 1964). Items indicating such confusion were labeled "duals." As described below, items were considered to demonstrate correct understanding of program type or incorrect understanding, or they were considered to be "dual" in nature (see examples below). Understanding was *incorrect* when any part of a statement or action violated the commonly accepted definition of a category; *correct* when it corresponded to the commonly accepted notion of that category; *"dual correct"* (dc) when children focused on the content of a show rather than or in conjunction with its visual appearance (e.g., an animated advertisement is an advertisement even though it looks like a cartoon); and *"dual incorrect"* (di) when the visual appearance of the show or show characters took precedence over the content of the show (e.g., since Flip Wilson or Fonzie is on *Sesame Street,* it is not *Sèsame Street*).

The child received credit for category recognition when judgments about this category were consistently greater than 75 percent correct. Independent judges obtained reliability of 92.5 percent in the correct, incorrect, and dual assignment of items. Final scores were agreed upon through discussion of individual items.

It should be noted that classification tasks were especially important in uncovering the point at which children seemed to distinguish correctly the program categories. In this task, children were given five to nine pictures from television shows and were asked either to free-sort them or to make piles of specific categories. Many of the children's category judgments were also made spontaneously, as can be seen in the examples given below (Note: i = incorrect, c = correct):

> *News example* (c): Child says "That's the news," having heard only the news audio from the television screen. The picture had not come in yet. (Donny, 4:6)
>
> *Children's-show example* (i): Child labels all the shows he watches "kids' shows" and he watches some adult shows such as soaps and news. (Donny, 2:11)
>
> *Sesame Street example* (i): Child says that only the bits with puppets are *Sesame Street* and denies that anything else is on *Sesame Street.* (Kathy, 2:1; Donny, 2:11)
>
> *Sesame Street example* (c): Child identifies all *Sesame Street* bits on videotape which consist of gamut of types of television fare. (Donny, 4:6)

Category Acquisition

1. *Results.* The 6-month interval during which each child consistently began to distinguish each category correctly more than 75 percent of the time is presented in Table 2. The average 6-month interval across all three children during which each category was correctly distinguished from the others is given as well. In addition, the ages at which dual items were consistently identified in terms of show content or intent as opposed to visual appearance are indicated for each child in Table 3. The two predominant dual situations were cases in which animated advertisements were compared with cartoons and those in which animated *Sesame Street* bits were confused with cartoons. Kathy also demonstrated some confusion when characters from other shows appeared on *Sesame Street.* At these times, Kathy denied the fact that the show was *Sesame Street* until she reached age 4:5 when she consistently took content into account over visual or character appearance.

2. *Discussion.* When the three children's ages of acquisition are averaged, advertisements constitute the first category acquired. There are several possible explanations for the early mastery of this category. First, *exposure* may play a large role. Unless there are children who watch only public broadcasting, all children are exposed to many advertisements regardless of their specific program preferences. Second, *appeal* may be an important factor in that many advertisements, especially those broadcast during children's programs, are designed expressly to appeal to children. Their fast pace and short length or formal features may capture children's attention, and their overall format may stand out for children, making a boundary separating them from other show types easier to distinguish (Lorch, Anderson, and Levin 1979; Watkins et al. 1980).

Finally, it is possible that the *disruptive nature* of advertisements may stand out for children in that they interrupt their shows and cause their favorite characters to

Table 2
Age of Acquisition of Principal Program Distinctions

Category	Age of Acquisition			
	John	Kathy	Donny	Average
Advertisements	2:0-2:6	3:7-3:11	3:7-3:11	3:0-3:6
Cartoons	2:7-2:11	4:0-4:6	3:7-3:11	3:7-3:11 (early in interval)
"Sesame Street"	4:0-4:6	3:0-3:6	4:0-4:6	3:7-3:11 (late in interval)
News	3:7-3:11	4:7-4:11	4:0-4:6*	4:0-4:6
Children's Shows	4:7-4:11	4:0-4:6	4:0-4:6	4:0-4:6 (late in interval)
Adult Shows	4:7-4:11	4:0-4:6	uncountable	4:0-4:6

*Although Donny obtained 75% during this interval, he exhibited confusion between news shows and ads during the 4:7 to 4:11 interval.

Table 3
Age at which Dual Items Are Correctly Classified

Type of Dual	John	Kathy	Donny	Average
Animated Advertisements vs. Cartoons	4:6	4:2	4:1	4:3
Animated "Sesame Street" vs. Cartoons	4:3	4:3	4:2	4:2½

disappear temporarily from the screen. In our observations of the subjects of this study we have found that, in their second year, the disappearance of characters is a source of consternation. Children become very upset and sometimes even cry when their favorite television personalities leave the screen. Advertisements may then be identified easily by children as the disruptive part of television which causes shows and their favorite personalities to vanish. Any one of these explanations or a combination of them may explain the fact that the boundary separating advertisements from other television shows is the first boundary to be established and perceived by children in their attempt to organize the world of television.

The order in which the children acquired the cartoon and *Sesame Street* categories conforms to the "exposure" hypothesis described above. John and Donny both distinguished cartoons before they did *Sesame Street,* while Kathy distinguished *Sesame Street* before she did cartoons. John and Donny also both watched an enormous number of hours of cartoons from the time they were 2 years old, and though they did watch *Sesame Street* quite regularly, the total number of *Sesame Street* hours did not even approach the number of cartoon hours. Kathy, on the other hand, was not allowed to watch cartoons until she was over 3 years old, while from the age of 2 she watched *Sesame Street* religiously and loved it. The exposure hypothesis would thus, at least partially, account for the order of acquisition of these two categories or boundaries. Format and visual appearance may also play an important role here. Cartoons are animated and their visual appearance is radically different from that of any other type of show. Thus, cartoons would be more easily distinguishable in that children would need only glance at the screen or at a picture of a show, attend to its visual features, identify it as animated, and label it a cartoon.

The salience of the visual appearance of cartoons for young children is supported by the fact that in the majority of the dual items children consistently labeled a show a cartoon until they were 4:0, regardless of the category in which the animated item actually belonged (*Sesame Street,* advertisements, or cartoons). The visual appearance was salient for all three children, although the content or information provided within that visual and/or audio format was secondary and often even ignored. Furthermore, the fact that *Sesame Street* was acquired later than cartoons may be explained by its use of a magazine format incorporating segments with diverse visual formats and character types. Although children may watch this show regularly from a very early age, it is not surprising that they have difficulty identifying its many different elements as being part of a single show. Indeed, the specific bits on *Sesame Street* may be viewed as instances of readily learnable "basic objects," while the overall category of *Sesame Street* represents the "more difficult to learn" superordinate category (Rosch et al. 1976).

The categories of children's and adult shows are acquired relatively late. Furthermore, when acquired, these categories are defined egocentrically as "shows I watch" and "shows Mommy and Daddy watch." Both these findings are instructive since, as will be seen shortly, children do not grasp abstract concepts such as producer's intent or target audience until past the age of 4. They seem unable to transcend their personal experiences to consider the motives or intentions of such remote figures as the producers of programs. In addition, children's and adult shows may be thought of as "superordinate categories," ones which contain heterogeneous mixtures of all the shows designed for and watched by either children or adults. In the first few years of attempting to sort out the confusing elements of the television world, children are concentrating on making *distinctions* between shows. It follows, then, that children are initially more aware of the obvious differences between shows such as *Happy Days* and *The Flintstones* (e.g., nonanimated vs. animated) and have difficulty grouping them on the basis of the relative abstract similarity which obtains among children's shows.

The *exposure* hypothesis would appear to account for the late acquisition of the news category. All children had an open aversion to watching the news; they avoided it at all costs. This implies that they must have recognized it when it came on the screen, since they were consistent in their statements of dislike. When shown pictures of various types of programming, however, children often could not identify the news shows and demonstrated confusion between news shows and commercials. Perhaps, while viewing, children were so quick to turn away from news shows that they did not absorb their entire format. The evidence indicates that children also did not fully absorb news content until age 4:5, at which point they were able to describe its purpose and its relationship to the real world.

Other Findings

1. Television characters. Television characters appear to play a large role in the development of children's understanding of the organization of the television world. Changes in children's perceptions of television personalities as organizing elements are described below.

(a) Two to three years. Children appear to be quite confused about the status of television characters during this year of development, but characters appear to play a large role in the 2-year-old's conception of the world of television. Any deviation from a show's regular cast bewilders the child and causes him to question

even a very familiar show's identity. Prototypical and preferred characters were focused on in identifying specific shows. Concurrently, and somewhat paradoxically, children's conceptions of individual shows and the boundaries between them are very insecure, and characters are perceived as being independent of their shows. They are believed to be able to appear on any channel at any time, roaming throughout television-land. Thus Roosevelt Franklin, a *Sesame Street* character, can appear on *Mister Rogers,* a child would say, but if this were to occur, the same child might very well deny that the show was, in fact, *Mister Rogers.*

(b) Three to four years. Our evidence suggests that, by this time, characters are perceived as belonging to specific programs. Donny, at 3:5, for example, correctly listed the characters in *The Flintstones* and *Family Affair,* and when he saw Big Bird and Grover on a game show at 3:2, John assured his mother that they would return to *Sesame Street.* Indeed, shows are now identified not only by attractive characters but by other elements (e.g., format, content) as well.

(c) Four to five years. There appear to be several elements of confusion for the 4- and 5-year-olds bent on exploring links between characters and their shows. First, most television characters do belong to specific shows and children appear to have grasped this fact by age 4. Television characters are, however, all on film and therefore potentially can be filmed on any show, on any channel, and with any other characters. This is where children encounter difficulties. By age 4 they know that characters are primarily associated with one show, but they often encounter televised situations in which a character appears on a show other than his own. Unaware of the technology and mechanics behind television production, they have trouble recognizing the flexible, manipulable link between characters and their shows and are hesitant to suggest that such situations—a character appearing on several shows—can occur. These situations violate their newly formed boundaries between programs and program types.

2. Producer's intent/target audiences. We have seen that by age 5, children have acquired several categories in which to organize the many types of television fare. The data suggest, however, that although boundaries may be established between certain types of programming, the various purposes or intentions of television production teams may not be understood. Advertisements may be the first correctly distinguished category, but as late as age 5, children do not appear to understand that their primary purpose is selling products. Children make requests for advertised products as early as age 3, yet when asked what advertisements do, children say that they "do nothing" (Donny, 5:2), and that they are "for no one and for nothing" (John, 4:6). Although children occasionally demonstrate some understanding of the intent of commercials—"want you to eat them [Hershey's chocolate]" (John, 4:9), or they "tell you what you can get and what's on" (Donny, 4:3)—there are as many examples which clearly indicate a lack of such understanding—"Ads do not want you to buy anything" (Kathy, 4:10) and "You can't get those cookies" (John, 5:1). This denial of the selling motive may reflect or mimic parental statements that all advertised products are not necessarily available to children, but it may also reflect a genuine misunderstanding.

The purpose of previews, a special type of advertisement which attempts to sell television programming, seems to be grasped by children earlier than the purpose of normal advertisements for goods and services. Children are able to explain the fact that previews tell you what a show will be about and when it will be on by late in their third year. The early understanding of this particular type of advertisement may be accounted for by the fact that children's television viewing is directly affected by them. Somewhat fancifully, we might regard previews as hypotheses which are confirmed by subsequent data (Kagan, Kearsley, and Zelazo 1978). A preview announces a show, the show appears, at which point the previews cease to appear. This is a straightforward, identifiable sequence of events. Moreover, while most ads suggest behaviors to be carried out in the external world, previews stand out as an instruction to carry out a television-specific behavior.

Children appear to understand the purpose of the news at the same time that they master the category. By age 4:5, children relate the news to the real world and appear to understand its role—providing information about the real world. For example, Donny, at 4:7, said that the news "tells real city life, the weather, dangerous things like cigarettes" and John, at 4:5, said that the news is about "real guys, the weather. It's a real show."

As late as age 5, children define the children's and adult show categories according to what they watch and what their parents watch. Although application of this classification may often lead to a correct classification, it is egocentric and does not take the producer's intent into account; at other times, therefore, use of this definition leads to incorrect categorizations. For example, if a child watches soap operas with his mother every day, he will put soap operas into both the children's and the adult show categories, even though soap operas are not intended for children but solely for adult audiences.

These findings suggest that, while children may, by the age of 4, organize the world of television in terms of certain program categories, they use concrete elements such as costumes or locations to define these categories. More abstract concepts, such as the producer's intent and target audience, and superordinate categories, such as children's or adult shows, are more difficult for children and are only begun to be comprehended after age 4.

3. *Temporal organization of television.* Within this category data were included that indicated children's knowledge of television schedules in terms of the sequences of shows, relevance to their own lives, or personal schedules (e.g., *Sesame Street* is on during dinner) as well as their recognition of the beginnings, endings, and interruptions (e.g., commercial breaks) of shows.

(a) Two to three years. During this year, children's conception of television's temporal organization is quite undeveloped. Television shows are perceived as continuously available throughout the day, and show endings are often not recognized and are confused with commercial breaks. In addition, children are concerned with the disappearance of characters from the screen. They appear to reassure themselves by mimicking television language such as "They'll be right back" when shows are over as well as when they are interrupted by commercials.

Eventually, children between the ages of 2 and 3 do begin to master the sequence in which their favorite shows appear, but this knowledge is mostly limited to that small number of shows which they watch most frequently.

(b) Three to four years. At this age, children still appear quite confused as to the timing and beginnings and endings or boundaries of television shows. Children still have difficulty accepting the fact that they cannot control this medium, that the timing and availability of their favorite fare is completely out of their hands and even out of the hands of their parents. They have not fully identified television as a conveyor of symbol systems, a separate world with its own rules and schedules, and, indeed, as a symbol scheme in its own right.

Concurrently, however, children begin to decode some of those rules. They recognize the beginnings and endings of their favorite shows, especially when a theme song is played, providing them with a clear cue. They begin to expand their knowledge of show schedules by associating particular shows with general time of day. They note previews which inform viewers of scheduling changes and begin to make comments such as "They're coming back" only at such appropriate times as during commercial breaks. Just as children are beginning to establish categories for and boundaries between types of television fare during this year, they are also beginning to recognize temporal boundaries and rules which organize and regulate the television world.

(c) Four to five years. Children display far more knowledge of television scheduling during this year. They are able to make distinctions between shows which are on every day (e.g., the news), those which are not (e.g., basketball), and specials which take the place of regularly scheduled shows and are on only rarely. They are often able to state the specific days and times at which various programs are broadcast.

Children have also incorporated the mutually exclusive relationship between advertisements and shows, making statements such as "when shows come off, ads come on" (Donny, 4:4; John, 4:6). Concurrently, they correctly identify those commercials which interrupt a program and those which signal the end of one program and the beginning of another. Children have become consistently correct in their recognition of show beginnings and endings, expanding the cues they use from songs alone to include logos, station signals, credits, and advertisements.

By the age of 5, children have become quite sophisticated in their comprehension of the temporal organization of the television world. They have been exposed to a great deal of television fare and have, with considerable success, unraveled the confusion of show segments, interruptions, and the connections between show times and real world times and events. They have established boundaries not only between television and real life and between various show types, but between elements within those show types as well. They have successfully begun to decode the symbol scheme of television, acquiring an understanding of its temporal rules and organization.

Conclusions: The Emergence of Membranes

Our guiding assumption, that children with little exposure to television would lack the cognitive structures necessary for assimilating its diverse images and sounds, has proved useful. As with the development of other symbolic capacities, such as language or storytelling, children appear to progress through a series of developmental stages in determining both television's relationship to their own world and the organizational system employed by the medium. Given the nature of this study, we have examined this development in terms of the changes which occur during each year of a 3-year period. As a means of recapitulating our findings, we present here the phases of development observed during these 3 years.

PHASE I Television's Initial Potency: The Lack of Boundaries

The 2-year-old experiences a great deal of confusion around the world of television. The images and sounds emerging from this box are new and chaotic. Yet the television is clearly a forceful, stimulating part of the child's daily life. It may often even be considered a member of the family. As such, it demands respect and, ultimately, understanding.

Of course, television is merely a physical object, not a literal family member. Its relation to daily life is complex, however. Sol Worth stated, "It should be obvious that, just as pictures are not simple mirrors of what is out there, neither are they artifacts which have no relation whatsoever to what they are pictures of" (1980). To the 2-year-old, this concept is not quite so obvious. Children of this age are actively attempting to determine television's role in their home, its relation to the real world. They see a box with some buttons and a piece of glass, containing many kinds of people, objects, and events. Some of these types of people, objects, and situations they have seen before, and they comment upon that fact. Others they have never seen before and comment on them as well. In their attempt to determine television's reality status, children of this age appear to be more aware of the similarities than of the differences between the two worlds. Often they perceive similarities where they do not actually exist. Children are attracted to the characters on television and perceive them as readily accessible to provide laps on which to sit, to receive kisses, and to accept help from the viewer in solving problems with which they are faced.

Even at this early stage children are beginning to become aware of a boundary, or membrane, between themselves and the world presented on television. At this time, however, the membrane is viewed as primarily permeable rather than impermeable. In fact, children of this age often behave in ways which indicate that they at times question the very existence of that boundary. Television is not yet understood to be a conveyor of symbol systems, and its characters are perceived as real life people, not as electronic images out of their viewers' reaches and control.

The boundaries which organize the inner world of television are perceived no more clearly than those separating television from real life. The various types of programming are not distinguished from one another, television shows are believed to be available at any hour that the child wants to see them, show beginnings and endings are not recognized, television characters are considered able to appear on any show, at any time, and their disappearance from the screen disturbs children greatly. Not only is the television world viewed as part of the child's own world, but its contents are viewed as a mélange without any organization and under the control of children and their parents.

This phase is thus characterized by a lack of boundaries. Television's symbolic status has not been established, and its symbolic status has not been decoded. As children acquire greater experience with this medium, however, they discover that their attempt to influence it directly is unsuccessful and they are forced to reorganize their conception of it. Near the end of this first phase of development and during the next year, children begin to recognize that there are separate television shows, that they can be identified most easily by their characters, and that the sequence in which they appear is consistent. These findings conform to claims in the classification research that children as young as age 2 have acquired rudimentary classification abilities (Goldberg, Perlmutter, and Myers 1974; Ricciuti 1965). Inasmuch as the programs and symbolic codes of television can be quite confusing, this is a remarkable achievement.

PHASE II The Symbol System Established: Decoding Begins

Between the ages of 3 and 4 years, children recognize the fact that the television world is in fact separate from their own. Its events do not actually exist in reality; they cannot be acted upon directly. Rather, they have communicational significance. Television presents a separate world with its own rules and organization. But this world does at times relate to experiences children have encountered in real life, and its organizational system parallels certain systems of organization they have encountered previously.

Children acknowledge that there are events on television similar to those in real life. The membrane between the two worlds is permeable at these times. The televised events often symbolize or communicate real world events. Children learn that there are other events which never occur in real life. At these times the membrane is viewed as impermeable.

Children also learn that people have developed a language to help describe television's inner organization. They begin to acquire definitions of some of the words of this language—advertisements, cartoons, *Sesame Street*—and come to understand that these words serve to impose boundaries within the television world. As used by the children, these first classifications seem to reflect immediately perceptible features (Denney and Acito 1975; Rossi and Rossi 1965). For a time, children perceive the boundaries between classes as rigid. A show can be in one category or another and a character can be on one show or another, never in or on more than one. As children begin to decode the rules of this symbol system, they adhere to them strictly, consider one element at a time, and are loath to acknowledge exceptions.

Yet, although children have begun to decode television's structure, they still remain confused about many aspects. For instance, they still have difficulty recognizing show beginnings and endings, finding it difficult and frustrating to accept the lack of control of this aspect of the medium.

PHASE III The Subtleties of Television's Symbolic Status: Emergence of Flexible Categorizing

During the year spanning age 4 to age 5, children accumulate evidence that their cognitive schema is too rigid: as a result, they relax the boundary between the worlds of television and daily reality. They recognize the membrane as a filter, having both permeable and impermeable components. A televised event may refer in part to a real world event, but in part it may deviate from anything possible in real life.

Consider John's response to seeing Donald Duck on television at age 4:10. He said that Donald Duck was like his family's ducks, but his family's are a different color and real. Donny at 4:11 sees a school on television and comments on its relationship to his own school, but says, "Mine isn't like this one, mine has toys." Such instances document the ability of children to overcome, to some extent, the centration which characterizes this age and to examine two aspects of a televised presentation at one time. Their mental representations of televised objects, people, and events may now involve more than a single element.

Along with their more sophisticated conception of television's reality status, children between the ages of 4 and 5 advance in their understanding of its structure as well. More categories of program types are established—news, children's shows, and adult shows—and the scheduling of shows is more clearly understood. Children seem to relinquish finally the notion of controlling the timing of shows and recognize the various cues which represent boundaries between or beginnings and endings of individual programs.

Work for the Future

Our preschoolers have come a long way from their initial perception of television as an extension of real life and as an amalgam of confusing images. They have established certain subtleties of its relation to their own world, and they have at least partially mastered the modes of organization built into it. Despite the hypothesized greater difficulty in making sense of the world of television, in contrast to the natural or social world, our subjects display principles of cognitive development which have been reported by investigators of other domains. That is, in defining a line between what is symbolized on television and what is encountered in daily experience, the children pass through the same steps they pass through in coming to understand other kinds of mediated presentations (Gardner 1973). And, in effecting distinctions among the dizzying multiplicity of shows presented on television, children once again exhibit the basic tendencies to classify reported by previous investigators.

Nonetheless, the unique nature of television, and the special problems it poses, are noticeable in children's early viewing experiences and will continue to be felt in a number of areas. To begin with, children need to acquire some degree of understanding of the technology behind television. This understanding will enable them to comprehend better the flexible link between characters and their shows and the ability of characters to appear on more than one show. It will also enable them to understand better the role of production teams, that they are the ones who control the programs and the characters on them. At the same time, they will acquire an understanding of the concepts of producer's intent and target audiences—the fact that the people who make the films projected on television also design those films to be watched by certain types of people.

As children's ability to classify continues to develop, and as this meshes with greater understanding of the nature of the medium, they will be able to evolve a more sophisticated classification system, that conceived by the makers of television. They will distinguish between shows *designed to* make people laugh (comedies); shows designed to frighten people (thrillers); those designed to teach (educational shows and documentaries); and those designed to entertain (serials, dramas, etc.). Children will also be expected to become more flexible in their perception of these categories, to recognize that certain programs may fall into more than one category and that exceptions to the definitions of categories may exist. Such understandings will allow children to apprehend shows in the manner in which they were intended and thereby to avoid potentially misleading confusions between, for example, documentaries and fictionalized history, or between children's shows and satires of children's shows. Much recent work suggests that youngsters (and even adults) may adhere to these confusions unless they are explicitly tutored about the lines that separate potentially interchangeable kinds of shows (Gardner, in press).

In addition, children will develop the ability to make more sophisticated distinctions between reality and fantasy. They will acquire an awareness of varying levels of reality, the contrast between surface reality and underlying psychological reality, the ambiguous reality statuses of characters such as superheroes, and the concept of stagedness—the fact that certain content is presented specifically for television and is rehearsed, scripted, and nonspontaneous. Indeed, such reality-fantasy distinctions in older children have been documented by Morison, Kelly, and Gardner (1980).

The agenda for the ultimate mastery of television remains formidable. All the same, the attainments during the first few years are so staggering that the ultimate mastery of these distinctions falls within the purview of every normal individual.

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Note

1 By use of this method of scoring, certain objective information was lost. For example, children might have a different set of definitions, or they might have an internally consistent way of classifying which differs from the classification system used by adults. Though aware of this possibility, we felt it would be more useful to employ an objective format in scoring. Given this decision, adult definitions of these program types appeared the most consistent.

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